Solutions: Estimation Checkpoint

Question 1

We say that a point estimator is **unbiased** if (choose one):

Select one answer.
10 points

- (a) its sampling distribution is centered exactly at the parameter it estimates.
- (b) the standard deviation of its sampling distribution decreases as the sample size increases.
- (c) its sampling distribution is normal.
- (d) its value is always equal to the parameter it estimates.
- (e) Choices (a), (b), and (c) are all true.

Correct answer: (a)

The next four questions refer to the following information:

A study was conducted in order to estimate μ, the mean number of weekly hours that U.S. adults use computers at home. Suppose a random sample of 81 U.S. adults gives a mean weekly computer usage time of 8.5 hours and that from prior studies, the population standard deviation is assumed to be σ = 3.6 hours.

Question 2

Based on this information, what would be the point estimate for μ?

Select one answer.
10 points

- (a) 81
- (b) 8.5
- (c) 3.6
- (d) None of the above.

Correct answer: (b)

Question 3

We are 95% confident that the mean number of weekly hours that U.S. adults use computers at home is:

Select one answer.
10 points

- (a) between 8.1 and 8.9.
- (b) between 7.8 and 9.2.
- (c) between 7.7 and 9.3.
- (d) between 7.5 and 9.5.
- (e) between 7.3 and 9.7.

Correct answer: (c)

Question 4

Which of the following will provide a more informative (i.e., narrower) confidence interval than the one in problem 3?

Select one answer.
10 points

- (a) Using a sample of size 400 (instead of 81).
- (b) Using a sample of size 36 (instead of 81).
- (c) Using a different sample of size 81.
- (d) Using a 90% level of confidence (instead of 95%).
- (e) Using a 99% level of confidence (instead of 95%).
- (f) Both (a) and (d) are correct.
- (g) Both (a) and (e) are correct.

Correct answer: (f)

Question 5

How large a sample of U.S. adults is needed in order to estimate μ with a 95% confidence interval of **length** 1.2 hours?

Select one answer.
10 points

- (a) 6
- (b) 12
- (c) 20
- (d) 36
- (e) 144

Correct answer: (e)

These next two questions refer to the following information:

A researcher would like to estimate p, the proportion of U.S. adults who support recognizing civil unions between gay or lesbian couples.

Question 6

If the researcher would like to be 95% sure that the obtained sample proportion would be within 1.5% of p (the proportion in the entire population of U.S. adults), what sample size should be used?

Select one answer.
10 points

- (a) 17,778
- (b) 4,445
- (c) 1,112
- (d) 67
- (e) 45

Correct answer: (b)

Question 7

Due to a limited budget, the researcher obtained opinions from a random sample of only 2,222 U.S. adults. With this sample size, the researcher can be 95% confident that the obtained sample proportion will differ from the true proportion (p) by no more than (answers are rounded):

Select one answer.
10 points

- (a) .04%
- (b) .75%
- (c) 2.1%
- (d) 3%
- (e) There is no way to figure this out without knowing the actual sample proportion that was obtained.

Correct answer: (c)

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